

# PATENT ABSTRACTS OF JAPAN

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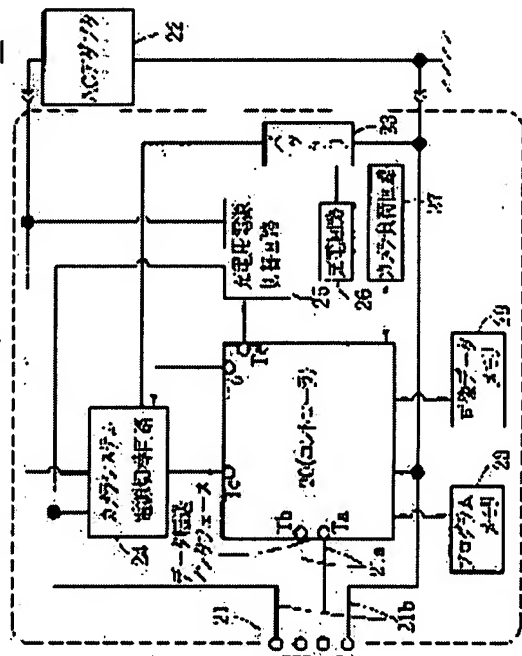
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## (54) ELECTRONIC STILL CAMERA

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To enable an electronic still camera body to charge a charging battery and transfer data simultaneously.

**SOLUTION:** The electronic still camera, on which with a connector 21 to which a cable capable of supplying power can be connected, is mounted, is prepared. A USB cable is connected to the connector 21. A controller 20 detects supply of power from power supply signal lines 21b and sends a switching signal to a camera system power supply changeover circuit 24 and a charging power supply changeover circuit 25 to carry out switching of power. A current, resulting from subtracting a current required for transfer of data to a computer from a supplied current received from the USB cable, is supplied to a charging circuit 26 to charge a battery 23.



## LEGAL STATUS

[Date of request for examination]

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CLAIMS

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[Claim(s)]

[Claim 1] In the electronic "still" camera which contained the charge circuit which charges the rechargeable battery with which data transfer with a computer is possible and it was loaded The connector to which the interconnection cable in which the current supply from a computer is possible is connected with data transfer, An electric supply detection means to detect the electric supply from the current supply terminal of said interconnection cable, and to output a change signal, The electronic "still" camera characterized by having the current supply change means which answers said change signal and changes the electric supply to said charge circuit from the electric supply terminal of an AC adapter to said current supply terminal.

[Claim 2] The electronic "still" camera according to claim 1 characterized by having the control means which supplies the current of the part which deducted the current which the data transfer between computers takes among the supply current from the current supply terminal of said interconnection cable to said charge circuit.

[Claim 3] Said control means is an electronic "still" camera according to claim 1 or 2 characterized by supplying the current of an insufficiency from a rechargeable battery when the current which the data transfer between computers takes exceeds the current acquired from the electronic supply terminal of an interconnection cable.

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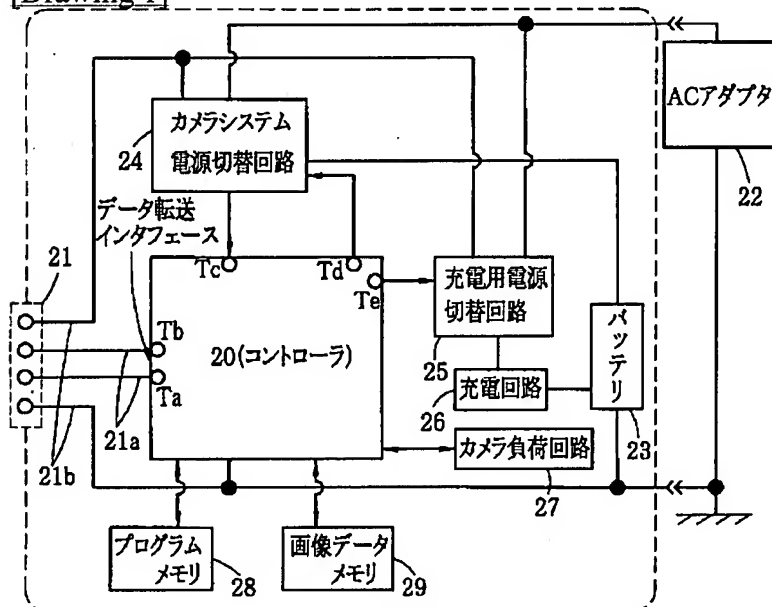
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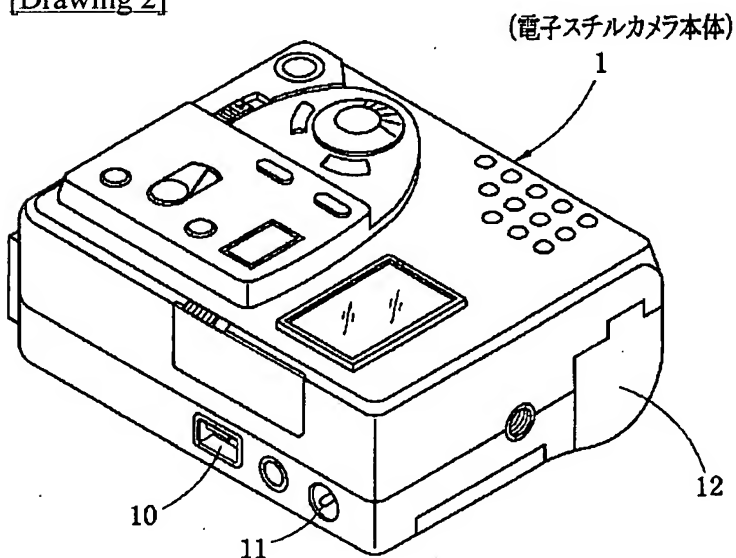
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## DRAWINGS

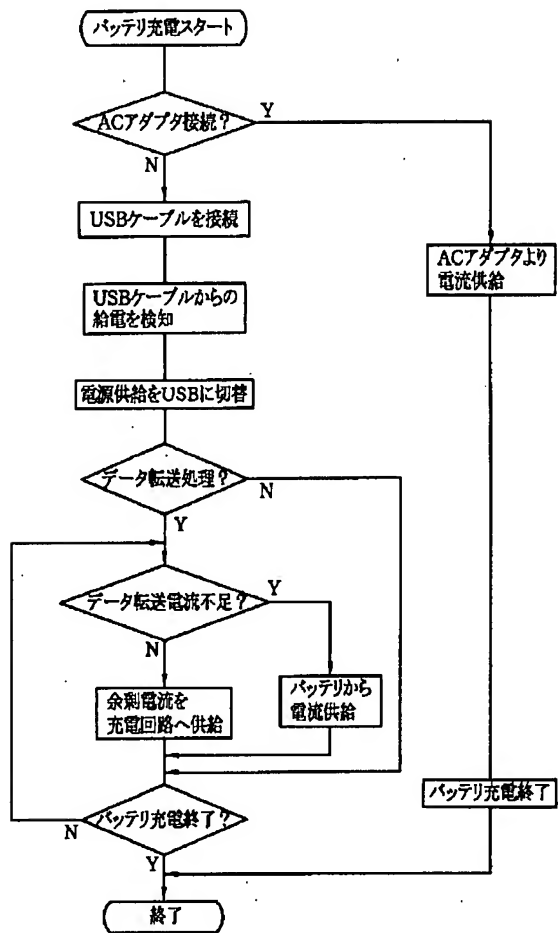
[Drawing 1]



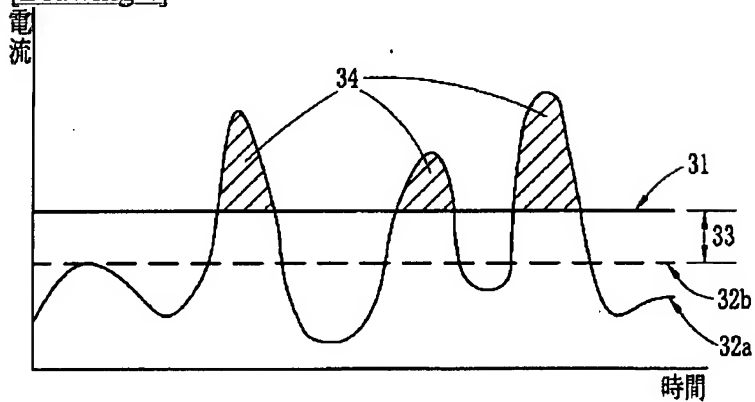
[Drawing 2]



[Drawing 3]



[Drawing 4]



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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the example of a system configuration of the electronic "still" camera of this invention.

[Drawing 2] It is the external view of the electronic "still" camera of this invention.

[Drawing 3] It is a flow chart explaining the actuation when charging the dc-battery built in the electronic "still" camera of this invention.

[Drawing 4] It is drawing showing the example of time amount change of the current when carrying out the charge and discharge of the dc-battery 23 of the electronic "still" camera which carried out this invention, and USB supply current.

[Description of Notations]

1 Body of Electronic "still" Camera

10 Digital Terminal

21 Connector

21a Data transfer signal line

21b Current supply signal line

22 AC Adapter

23 Dc-battery

24 Camera System Power Electronic Switch

25 Power Switching Circuitry for Charge

26 Control Circuit

31 USB Supply Current

32a The working current of operation

32b Average working current of operation

33 Difference

34 Undercurrent

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the electronic "still" camera which charges a dc-battery in more detail using a data transfer cable with a computer about an electronic "still" camera.

[0002]

[Description of the Prior Art] As a power source of an electronic "still" camera, rechargeable batteries, such as NIKKADO / nickel hydrogen which can mainly be charged, etc. are used. This rechargeable battery removes cell covering in the body of an electronic "still" camera, and loads with and uses it for an electronic "still" camera. If the power charged by the rechargeable battery is used up, an electric power supply will stop. In order to use a battery charger again, a user will charge. As for the charge approach of a rechargeable battery, it is common to pick out a battery charger from an electronic "still" camera, and to charge by setting to the battery charger of dedication. Charge takes fixed time amount for every product.

[0003] Moreover, an electronic "still" camera can be connected to a computer and data, such as a photoed image, can be transmitted. When supply current stops, he connects an AC adapter etc. to an electronic "still" camera, and is trying to acquire a current so that data transfer may not be cut in order for data transfer to take many currents from the current supplied from a rechargeable battery etc.

[0004]

[Problem(s) to be Solved by the Invention] However, by the approach of charging the battery charger of an electronic "still" camera separately as mentioned above, the top where the activity of installation/removal of a battery charger etc. is troublesome, since preparation of a battery charger etc. was also needed, also when a user sensed inconvenient, it was. Moreover, if a rechargeable battery [ finishing / charge ] etc. was not separately prepared in order for charge to take fixed time amount, there was a fault that an electronic "still" camera could not be used during charge.

[0005] In case data transfer with a computer was performed, as mentioned above it not only connects a data transfer cable, but, it had to carry out to connection of an AC adapter etc. for current supply, and connection was troublesome. Moreover, not using the AC adapter etc., supplying a power source from a rechargeable battery etc. was considered, and since many currents were used for data transfer, the current supply of a rechargeable battery could not but stop and, for a certain reason, that data transfer is cut also could not but use the AC adapter etc.

[0006] This invention aims at offering the electronic "still" camera which could be made to perform charge of a battery charger, and data transfer in connection of only a data transfer cable.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the electronic "still" camera of this invention In the electronic "still" camera which contained the charge circuit which charges the rechargeable battery with which data transfer with a computer is possible and it was loaded The connector to which the interconnection cable in which the current supply from a computer is possible is connected with data transfer, It has an electric supply detection means to detect the electric

supply from the current supply terminal of said interconnection cable, and to output a change signal, and the current supply change means which answers said change signal and changes the electric supply to said charge circuit from the electric supply terminal of an AC adapter to said current supply terminal. [0008] Moreover, it has the control means which supplies the current of the part which deducted the current which the data transfer between computers takes among the supply current from the current supply terminal of said interconnection cable to said charge circuit.

[0009] Moreover, said control means supplies the current of an insufficiency from a rechargeable battery, when the current which the data transfer between computers takes exceeds the current acquired from the electronic supply terminal of an interconnection cable.

[0010]

[Embodiment of the Invention] The system configuration of an electronic "still" camera is shown in drawing 1. The electronic "still" camera of this invention mainly consists of a controller 20, a connector 21, a dc-battery 23, the camera system power electronic switch 24, the power switching circuitry 25 for charge, a charge circuit 26, a camera load circuit 27, program memory 28, and an image data memory 29. The camera load circuit 27 is a circuit which performs image pick-up and image data processing, and an image data memory 29 is a medium which records the picturized image.

[0011] There is an approach using the power source supplied from the interconnection cable connected to the connector 21 other than AC adapter 22 which is an external power, and the dc-battery 23 which performs charge and discharge as a power source which drives the electronic "still" camera of this invention. In drawing 1, the USB cable is used as an interconnection cable in which current supply is possible. There are four signal lines in a USB cable, and it consists of two data transfer signal-lines 21a and two current supply signal-lines 21b. A power source is supplied to an electronic "still" camera through these two current supply signal-lines 21b. By using a USB cable, with the electronic "still" camera of this invention, while performing data transfer to a computer, a dc-battery 23 can be charged.

[0012] A controller 20 functions as an electric supply detection means to detect the electric supply from the current supply terminal of said USB cable, and to output a change signal. The power source supplied from AC adapter 22 and the USB cable is used also for charge of a dc-battery 23. The camera system power electronic switch 24 and the power switching circuitry 25 for charge answer the change signal of a controller 20, and function as a current supply change means which changes the electric supply to said charge circuit 26 from the electric supply terminal of an AC adapter to the current supply terminal of a USB cable.

[0013] The external view of the electronic "still" camera which used this invention for drawing 2 is shown. When performing data transfer to a computer, the digital terminal 10 which connects a data transfer cable is mounted in the side face of the body 1 of an electronic "still" camera. Drawing 2 shows the example which mounted the USB terminal supposing the case where a USB cable is used as a cable. This digital terminal 10 contains said connector 21. It ranks with the digital terminal 10 and the power-source input terminal 11 is mounted in the side face of the body 1 of an electronic "still" camera. By inserting the code from said AC adapter 22 in the power-source input terminal 11, a power source can be supplied to an electronic "still" camera. Moreover, the cell covering 12 is formed in the base of the body 1 of an electronic "still" camera. If the cell covering 12 is removed and the charged rechargeable battery is inserted, an electronic "still" camera can also be operated by using a rechargeable battery as a power source.

[0014] Next, the charge approach of the dc-battery 23 built in the electronic "still" camera of this invention is explained using drawing 3 and drawing 4. Charge of a dc-battery 23 is performed using the power source supplied from AC adapter 22 or a USB cable. When AC adapter 22 has connected with the power-source input terminal 11 of an electronic "still" camera 1, charge of a dc-battery 23 is performed using the power source supplied from AC adapter 22. When the AC adapter has not connected with an electronic "still" camera 1, charge of a dc-battery 23 is performed using a USB cable.

[0015] If a USB cable is connected to an electronic "still" camera, the controller 20 which received directions of program memory 28 will require a power source of the computer which is a USB host first. At this time, a controller 20 requires the maximum of the current of a USB cable which can be supplied,



and passes the current which can be supplied from a computer. This current corresponds to the USB supply current 31 shown in drawing 4.

[0016] A controller 20 detects the electric supply from current supply signal-line 21b, and a change signal is changed to the camera system power electronic switch 24 and the power switching circuitry 25 for charge, and it changes delivery and electric supply to USB. By the USB cable, data transfer is performed to charge and coincidence using data transfer signal-line 21a.

[0017] The current supplied from the current supply terminal of a USB cable is used for the data transfer from an electronic "still" camera 1 to a computer. The power source which a USB cable supplies is a fixed electrical potential difference (about 5 V), as shown in 31 of drawing 4. The current which an electronic "still" camera uses for data transfer is fluid by operating state, as shown in 32a of drawing 4. Therefore, the condition that the condition that the currents used for data transfer are insufficient, and a complementary are is repeated. A controller 20 supplies the current of the part which deducted the current which an electronic "still" camera uses for data transfer with a computer among the supply current from a current supply terminal to a charge circuit 25. When the current which data transfer takes exceeds the current acquired from the current supply terminal of a USB cable, the current 34 of an insufficiency is supplied from a dc-battery 23. Even when the currents supplied from a USB interface run short by this system, cutting of a USB interface can be prevented. Moreover, when not performing data processing, the current acquired from the current supply terminal of a USB cable is used for charge of a dc-battery 23.

[0018] Although the current which an electronic "still" camera actually uses for actuation is drawn on drawing 4 with the curve of of operation working current 32a, it is the straight line of of operation use average current 32b which expressed the average of this current with the graph. The difference 33 of the USB supply current 31 and of operation use average current 32b is used for charge of a dc-battery 23.

[0019] Although the USB cable is used with the above-mentioned operation gestalt, it is also possible to use an IEEE1394 cable or the cable in which other current supply is possible instead of a USB cable. Since a data transfer signal line becomes four unlike the USB cable which consists of two current supply signal lines and two data transfer signal lines when using an IEEE1394 cable, it is necessary to change a connector.

[0020]

[Effect of the Invention] As mentioned above, since according to the electronic "still" camera of this invention an AC adapter is not needed and a dc-battery can be charged during the activity of data transfer etc. in case the data transfer to a computer etc. is worked, easy-izing of an activity and the unusable condition of the camera by the lack of charge of the dc-battery after an activity are avoidable. Moreover, since it can charge only by having connected the camera to a computer, it is not necessary to perform installation/removal of dc-batteries, such as a rechargeable battery, and preparation of a battery charger etc. also becomes unnecessary.

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